

Z88 EPROM

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Club Addresses

All articles for **Z88 EPROM** and any membership matters (except Software Library) should be sent to:

**ROY WOODWARD
Z88 USERS' CLUB
68 WELLINGTON STREET
LONG EATON
NOTTINGHAM
NG10 4NG**

All requests for software from the Club Software Library, items for inclusion in the Library, and EPROMs for erasure should be sent to:

**IAN BRABY
THE SOFTWARE LIBRARY
Z88 USERS' CLUB
3/8 JENNER ROAD
GUILDFORD
SURREY
GU1 3PL**

Please note that the **Library** address is the one to use when sending for a list of Library programs - this list is **not** available from the main Club address. Be sure to enclose £1 plus a SAE for the list. Also note that this list now includes the CLI Library list.

CLIs for inclusion in the Software Library should be sent to:

**MICHAEL HEY
18 WOODSIDE ROAD
SANDIACRE
NOTTINGHAM
NG10 5GP**

ALWAYS include your Membership Number with any correspondence. This is not just to be awkward - now the Club is large it can be very time-consuming searching the database for a member's number. Your number is printed on the address label of each issue of **Z88 EPROM**. Please be sure to enclose a stamped-addressed envelope with anything needing a reply.

Editorial

I'll bet you couldn't believe your eyes when this envelope dropped through the letterbox. "Another **Z88 EPROM** so soon? Surely not!" I hear you all saying. Well, your eyes are not deceiving you - it really is here during the same month as is printed on the cover!

Because of the swift follow-on from the previous issue, there is not a lot new to tell you in this one. I am writing this editorial flat out again - my back started twingeing a couple of days ago, and I thought that I should err on the side of caution, and rest it before it gets worse!

Bad news on the spares front, I'm afraid. CCL have once again "adjusted" their spares prices, and you will find a new list of spares prices in the ad elsewhere in this issue. The most dramatic change is again to the price of the keyboard membranes, which have caused the price of replacement keyboards to go up from £29.95 to £33.95.

While on the subject of spares and things, several members have written to me asking where they can get tractor feed personal organiser paper, so that they can make the best use of the excellent Library program, Z88 Fax (Z047). Well, you will be glad to hear that I have now obtained supplies of this paper, and it is available in packs of 250 sheets for £7.50. This is excellent quality, and has microperforations to leave nice clean edges when the holes are torn off.

As you will have noticed from the ad in the last issue, the All Formats Computer Fairs will be in full swing again by the time you read this. Please make the effort to come along and say hello if you possibly can - it is certainly nice to meet members and get some feedback about the Club services. Also don't forget the Club Workshop on October 26th ("How can we", I hear you all saying!).

After one or two problems getting hold of the chips for the new 1M RAM cards, I understand that this is now sorted out and several dealers have them in stock. Still no sign of any movement on pricing of the 128k EPROM and 512k RAM cards from CCL - it can't be far away, as now the new cards are available the 512k RAM and 128k EPROM at their current prices will simply sit on the shelves.

While on the subject of CCL - still no contact from Alan Oxley, the new Marketing Guru. Does he exist I wonder?

Finally, a quick plea (no, not about the Workshop again!). Following on so quickly with another issue of **Z88 EPROM** has just about cleared me out of contributions, so please, in order that the next one comes out before 1992, please get writing! The use of Club EPROMs is still there - if you don't have an EPROM or disk of your own to sent in the contribution, simply send me a printed copy, asking for the loan of a Club EPROM so that you can save the file onto it and return it to me. It may sound complicated, but it certainly does save me all that tedious re-typing.

That's all folks!

Newslines

Cambridge Go Direct

By the time you read this Cambridge Computer should have embarked on a direct marketing campaign for the Z88. Bypassing the current distributor and dealer network, the promotion involves two new packs aimed at the business user, and these will initially be promoted by the insertion of an A4 full-colour leaflet into various business magazines.

The two new packs, called the Traveller Pack and the Executive Traveller Pack, are basically variations on the current All-In-One pack, but offer more hardware for less money.

The Traveller Pack consists of Z88, mains adapter, 128k RAM card, PC Link, parallel printer cable and a carrying case, all for £309.95 including VAT.

The Executive Traveller Pack is a Z88, mains adapter, 512k RAM, 128k EPROM, EPROM eraser, PC Link, parallel printer cable and carrying case for just £434.95 including VAT.

Both the packs are exclusively available from CCL direct, and they have set up a special credit card hotline to receive orders. At the moment it is unclear whether these new packs will also be available through the traditional dealer network.

This new promotion is certainly a major departure for CCL. They have previously relied totally on their distributor and dealer network, and this direct selling campaign must call into question the future of the present distributor network. Perhaps CCL will soon be dealing direct with dealers, rather than using distributors who obviously have to make their own profit on the goods before selling it on to dealers.

Whatever happens, this new promotion can only be good for the Z88 market generally, as more machines in circulation is good news both for the Club and for third-party vendors.

Helpline

If you have a technical query, write to one of our Helpliners listed below. Please note that you should include a stamped addressed envelope or sufficient return postage for your reply.

CLI Files - Contact Michael Hey by post only at: 18 Woodside Road, Sandiacre, Nottingham. NG10 5GP

Z88 to Amstrad PCW Link - Please write in the first instance to: Mr A West, 16 Southway, Burgess Hill, Sussex. RH15 9ST.

zBASE, CLI and all Wordmongers products except TX and Comms software - Contact Jason Crook (ex of wordmongers) at TPR. J.S.A. Crook, 4TP B SQN, The Royal Hussars (PWO), Swinton Barracks, BFPO 17. I will also write to order in zBASE.

zBASE - Help on commands and programming. I can accept info/programs on paper. EPROM, zTape cassettes or IBM disk. Contact Robin Jarvis, 27 Gloucester Road, Waterlooville, Hants. PO7 7BJ.

Z88 to Amstrad CPC Link - Contact Duncan W. Kennedy at 32 Otterston Grove, Dalgety Bay, Fife. KY11 5PA.

BASIC Programming - Contact Richard Russell at 59 Campbell Road, Gravesend, Kent. DA11 0JZ.

Interfacing Z88 to various hardware - Mac, BBC, PADs, also UNIX and C experience - Contact J.P. Knight Email JANET on jpknight@uk.ac.lut.sunu, or snail mail during term time to Room 66, Hazlerigg-Rutland Hall, Loughborough University of Technology, Ashby Road, Loughborough, Leics, LE11 3TZ.

PipeDream/Diary/General - Contact Keith Winsor at 13 Swansea Road, Reading, Berks. RG1 8EY. Or Telecom Gold 82:TLR1747.

Z88-PCW Link - Using C-Port program. Please contact David Prestage at 47 Knighton Road, Otford, Sevenoaks, Kent. TN14 5LD.

Anything Educational - Please contact Bob Shore, 8 Anchor Close, Hathern, Leics. LE12 5HP. Telephone 0509 842670.

Machine-code Programming - Please contact Richard Smith, 29 Sandhouse Crescent, Scunthorpe, South Humberside, DN16 1JF.

Printer Setups - Please contact David Stewart at 44 Margetts, Hemingford Grey, Huntingdon, Cambs. PE18 9EP. If you have any queries concerning general printer problems, eg. correct use of cables, how to connect up the printer, printer code language, understanding the information in the printer handbook, etc. please write to David. Notes on Printing, covering the above topics, are available by post from David. Price @3.00 for 30 A4 pages of detailed advice.

File Transfers - Free file transfers to/from most formats (excluding Amiga). 10 files max. and must be Z88 related - no commercial programs copied. Send disk and pre-formatted copy media, with Club Membership and return p&p to: Phasor Video, Elcot Lane, Marlborough, Wilts, SN8 2AZ. Tel: 0672 514451 (2.00-5.00pm Mon-Fri)

Members' Letters

Dennis Groning (1080) Sweden

Dear Roy

I found the letter from the Danish Z88 Developers Team very interesting, and I agree with them on most points. If we had more groups as dedicated in other countries, I'm sure we would have much better Z88s today. Now I would like to share some of my findings with other members.

Serial Communication With The Z88

SERIAL PORT

Pin 7 is the Signal Ground, GND. All other signals are relative to this pin.

Pin 2 is used for Transmitted Data, TxD. When the Z88 is on, it carries a negative voltage. When sending, it puts out positive voltage signals.

Pin 3 is used for Received Data, RxD.

Pin 5 is called Clear To Send, CTS. If the Z88 is trying to send, nothing is sent unless a positive voltage is received on this pin.

Pin 4 is called Request To Send, RTS. When the Z88 is turned on this pin carries a positive voltage. If the Z88 receives data without being able to process the data, or it is received faster than can be processed, the receive buffer will start to fill. When it becomes more than half full, pin 4 will shift to a negative voltage. When data has been processed so the receive buffer becomes less than a quarter full, it will shift back to a positive voltage.

Pin 8 is called Data Carrier Detect, DCD. Received data is not valid unless a positive voltage is received on this pin.

Pin 9 is called Data Terminal Ready, DTR. When the Z88 is on it carries a positive voltage (switched +5V at 1 milliamp). This pin is also positive for a moment every other minute when the Z88 is off.

Pin 1 carries a positive voltage (unswitched +5V at 10 microamps) at all times power is available (Also when the Z88 is off). Should not be used.

Pin 6 is not used.

CONNECTING TWO Z88S.

Pins 7 on both Z88s should be connected to make a common base to compare other pins voltages to.

Pin 2 on the sending Z88 should be connected to pin 3 on the receiving one.

What's also needed is a positive voltage on pin 5 on the sending Z88 to be able to send. The receiving Z88s' pin 4 is the most suitable source because it stops the sending Z88 by going to a negative voltage when the receive buffer begins to fill.

Now data can be sent but it is not received as valid until a positive voltage is received on pin 8 on the receiving Z88. The signal can be taken from pin 9 on the sending Z88 or from its own pin 9 to save a lead in the cable.

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The cable is then connected, 7-7, 2-3, 5-4, 9-8. To be able to send in the opposite direction, add the connections 3-2, 4-5 and 8-9.

HARDWARE HANDSHAKING

The interaction between pin 4 and 5 is called hardware handshaking. This is always active on the Z88.

SOFTWARE HANDSHAKING

The Z88, some printers, some MNP modems and some other computers depending on communication programs can use Xon/Xoff software handshaking.

The sending Z88 starts with sending one Xon character before data is sent.

The receiving Z88 sends an Xoff character if the receive buffer becomes more than half full.

The sending Z88 stops sending when a received Xoff character has been processed. If there already are characters in the sending Z88s receive buffer, there may be a delay.

If the receive buffer becomes 7/8 full an Xoff character is sent for every received character.

When data has been processed so the receive buffer becomes less than half full, an Xon character is sent.

When the sending Z88 receives the Xon character, it resumes sending.

When using Xon/Xoff it is possible to manage with only 3 leads in the cable. Connect 7-7, 2-3, 3-2. Connect pin 5 and 8 to pin 9 in the same plug in both ends.

Set Transmit and Receive baudrate to 9600, Parity to None and Xon/Xoff to Yes in the Panel settings on both Z88s.

SENDING TO A Z88 WHICH IS NOT READY

Pin 4 is positive when the Z88 is turned on. That means data can be received even if you are not in, for instance Terminal. 96 bytes will be received before pin 4 shifts to a negative voltage and the datasender can be stopped. If you then enter [JV Terminal, or [IX Imp-Export, R]eceive file and specify a filename, or [JB BASIC and OPENIN a channel to :COM, the following bytes will be received correctly but the 96 bytes are lost.

SENDING THE BITS

Pin 2 carries a negative voltage except when sending data by putting out positive voltage signals. Data is sent as codes between 0 and 255.

DATABITS

A number in this range can be thought of as consisting of 0 or 1 component worth 1, + 0 or 1 component worth 2, + 0 or 1 component worth 4, etc. to 0 or 1 of the eighth component worth 128. The biggest number that can be represented is then if we have 1 of each of the 8 components which are called bits. That means $1+2+4+8+16+32+64+128 = 255$. The smallest is $0+0+0+0+0+0+0+0 = 0$ and any number in between can be combined by the appropriate bits.

The 'Exact space', <> SPACE, character has the code $160 = 0+0+0+0+0+32+0+128$. It is sent by holding pin 2 at a negative voltage for 5 timeunits for the zeros, at a positive voltage for 1 timeunit for the 32, at a negative voltage for 1 timeunit for the 0 and at a positive voltage for 1 timeunit for the 128. The 8 timeunits have the voltages ----+-.+

BAUDRATE

One bit is sent in one timeunit. Transmission speed is measured in baud = bits/second. At 9600 baud one timeunit is then $1/9600$ second = 0.000104 seconds.

STARTBIT

As mentioned earlier, pin 2 is negative when not sending. The 'Exact space' characters' first bit was 0 = negative voltage. For the receiver to know when a character with the first bit = 0 begins, every character is preceded by 1 timeunit at a positive voltage, the start bit. The startbit and the 8 databits have the voltages +----+-.+

STOPBITS

The last databit for sending 'Exact space' was positive. The startbit is also positive. In order for the receiver to know when the startbit of the next character begins, there must be a pause when the voltage is negative. The receiver may also need some time to be ready for the next character.

On the sending Z88 the pause is 2 timeunits. It puts out 2 stopbits. On receiving the Z88 needs a pause of 1 timeunit. It needs one stopbit. The pause can be any length if at least 1 timeunit. The startbit, 8 databits for 'Exact space' and 2 stopbits then have the voltages +-----+---.

PARITY

The parity options Even and Odd are a way of error recognition. Only 7 databits are used. Using Even parity to send a space character, code 32 = 0+0+0+0+0+32+0, the number of set databits is 1 which is not even, then the eighth bit, the parity bit is set to make the number of set bits among the data and parity bits even. The startbit, 7 databits, 1 paritybit and 2 stopbits then have the voltages +-----+---. If the parity was Odd, the number of set bits would already be odd and the parity bit would not be set (=0) and the voltages would be +-----+-----. The receiver can then check for corruption by checking if the number of set bits is odd or even.

The option Mark means that the parity bit is always set, and Space means that it is never set.

When receiving the Z88 does not check if the parity is correct. If receiving odd or even parity, the parity bit is taken as the eighth databit so every character that has the parity bit set has 128 added to the code. Most codes over 126 are shown as a black square on the screen.

SPEED OF FILE TRANSFER.

For some time I have been trying different methods of transferring files to and from other computers.

The fastest way of sending I've found is the Filer copy command, entering :COM as new filename.

Sending the library program Z051A, z88com.bas, no receiving computer, just pin 9 and 5 connected, takes 34 seconds, using baudrates 9600, 19200 or 38400!

The filelength is 11040 bytes. One byte is sent as 1 startbit, 8 databits and 2 stopbits. To send it in 34 seconds, the needed transmission speed is $11040 \cdot (1+8+2) / 34 = 3572$ baud. The higher baudrates works, but there is no gain in speed.

The Z88 Developers' Notes v2.00 says that when using software handshaking, the performance of the serial port is seriously reduced, because at 9600 baud or more the software handshaking will need an intercharacter gap to catch up and not lose characters. It seems like OZ puts in the gap even if Xon/Xoff is set to No.

Using Imp-Export, most bytes lower than 32 and all higher than 126 are sent using 4 bytes. For this file 15620 bytes are sent in 54 seconds. No receiving computer.

Using Imp-Export, sending to a Receiving Spectrum using Z110, Z88-IMPEXP, takes 60 seconds, and Batch receiving takes 489 seconds. Sending back takes 59 seconds.

Using PC-Link 2, 15620 bytes are sent, and 15620 acknowledge bytes are received. That's 31240 bytes transmitted in 100 seconds. Sending back is the same.

Using RangerLink the same file is saved to PC and fetched from PC in 25 seconds.

Using z88com.bas to send z88com.bas to a PC with the PROCOMM program takes 48 seconds. It is saved on disk with the file filled out with NULs, to make the last 128 byte block full. This is OK for loading back a BASIC program, but I'm not sure about other files. Sending these 11136 bytes back takes 28 seconds.

Using Spectrum-Link Z133 to send 11040 bytes to the Batch receiving Spectrum, takes 53 seconds. Sending back takes 70 seconds.

The Spectrum-Link can also archive files in Imp-Export serial format individually on PC disk. Sending z88com.bas takes 65 seconds. Receiving to [X Imp-Export takes 40 seconds.

RECEIVING. Can anyone come up with a faster way of receiving a file then using BGET and BPUT?

Naturally, I tried the Filer copy from :COM. The file is not received until I press ENTER, but I suppose it is redirected to :NUL.

I also tried the Terminal, but output to screen and a spool file is filtered from ASCII-characters 0 to 6 and 14 to 31 and ESC sequences. Some ESC sequences are replaced by other characters. Characters are also lost when receiving at 2400 baud or higher.

CLI ESC. Users of non-British Z88s can have a problem with CLI commands using ESCAPE, ASCII-code 27, which is represented by || in British Z88s. The library programs 21, 28, 29, 108, 121, 123 and a Cardbase-file at least, use it. To check if there is a problem, go to BASIC. If pressing <> and | has the same action as ESC it is OK. If not, press other key combinations until Escape is accomplished. With the Swedish Z88 this happens when pressing <> and , (comma). That is |, for CLI use.

Load the suspect program. Enter the command LIST IF || and hold the spacebar down, lines containing || are listed. For Swedish Z88s, replace "||" with "|||,", then it will work on Swedish and British Z88s.

RAM.-FILES.

Recently I had a crash needing a HARD RESET, I think after using a program using a :RAM.- file. The library programs 12, 21, 28, 29, 108, 123 and some more use them. Also programs normally erasing :RAM.- files after use can be disasterous if escaped or left using INDEX or ||. For reliability they could be changed to use :RAM.0 or 1 instead.

Z88: A DABHAND GUIDE.

When I got my edition in January 1990, I wrote to the publisher. An errata sheet was being prepared which I received free in June. It's 8 pages with some corrections, serial and parallel port connections, the 8 international (Danish, French, German, Italian, Spanish, Swedish, Swiss and Turkish) keyboard layouts, and an index. The book has information of Terminal control codes and some VDU codes not mentioned even in the Developers notes v2.00. Dabs cancelled production of a planned Technical Guide.

USERS MANUAL.

A while ago I obtained the User Manual, Edition 3. It has 32 more pages than edition 2, and I think it is now one of the best books on the Z88. It inspired me to compile a list of additions and corrections to it, which now is 5 pages long. Some of it is of interest especially for Swedish or other national Z88 owners. Maybe I can make it into articles for Z88 EPROM ?

BATT LOW, HOW DANGEROUS ?

Reading Jack Lawries' article on battery life, I might comfort some by telling my experience of using the Z88 after the Batt Low

warning comes on. For three years I have been using it with a 512k RAM cartridge with typically 100-150 files taking at least 400k, and three sets of four ordinary AA NiCads. The time from fully charged to Batt Low might be 2-3 hours effective time. Then it can take down to a few minutes until the screen flickers and dies. I always continue turning it on until it refuses to stay on. Cambridge warns about this but in this time I have not had one crash that I can refer to low batteries.

PRINTED BUG.

I guess not many realised that the bug can be fixed without loading into PipeDream. If the option for 'Off at CR' for 'Ext. sequence' is 'Y', move the cursor to that Y and press Y. Save the driver, <>FS, with a suitable name. The above Y option of the default Epson printer driver is not saved at all if you don't enter it specifically.

CANON BJ10E.

To print microspaced elite pitch text enter HMI: Prefix ESC,"d", Suffix 0 and Offset 246 in PrinterEd. In PipeDream enter <>PM Y 10 and print out. For printing microspaced pica pitch, enter Offset 244 and just <>PM Y (= <>PM Y 12). To print double-high and double-wide enter ESC,"I","@" ,4,0,0,0,2,2 as ON String and ESC,"I","@" ,4,0,0,0,1,1 as OFF String in PrinterED. If bold (emphasized) printing is applied on condensed 17 pitch it is printed as 10 pitch bold. Enter the code for Double-Strike ESC,"G" as ON String and ESC,"H" as OFF String for Bold in PrinterEd instead.

Charging Alkaline Cells

By Jack Lawrie (4635)

It is claimed that a charger of the type described here is suitable for recharging alkaline cells, like those used in the Z88.

Some people, myself included, have recharged these cells for many years in NiCad chargers, without any problems.

It is said that if AA size cells are given a forward charge of 50 milliamps, alternating (at mains frequency) with a reverse current of 10 mA the risk of internal distortion and possible leakage which, it is said, can result from charging in NiCad chargers, is avoided.

(The method is not restricted to AA cells but this is the type that Z88 owners are mainly concerned about).

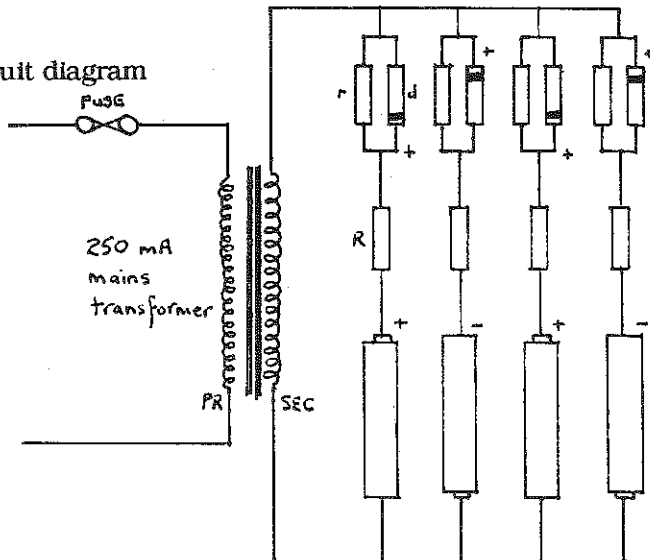
This method is known as 'periodic current reversal' - PCR. It is claimed that there is no danger in this method - Japan encourages it and chargers of this type are sold there - cells made in Japan only carry a warning about not charging on exported cells. UK manufacturers put a warning on cells sold here - "may explode if recharged" - but this does not appear on exported cells!

If claims that cells can be recharged up to 20 times are to be believed is anyone surprised? - remember the everlasting match?

The following guidelines are offered for this method - 1. Limit the charging currents and the recharge time. 2. Recharge cells as soon as they are taken out of service. 3. Use only reputable makes and don't run them too far down. 4. All cells benefit from this method, not just alkaline types.

As the diagram shows, the charger is for 4 cells, not connected in series but coupled in a way that imposes a balanced load on the transformer. Two or four cells are to be charged at the same time, preferably four, NOT one or three. It is also advisable to keep the 'set' of four cells together, not mixing them with others and not introducing an older or newer cell into the set, though there is a negligible chance of cell reversal as the cells are not connected 'in series'.

Fig 1: Circuit diagram



As stated above, the forward and reverse currents for the AA size of cell are 50 mAmps and 10 mA respectively. The values of resistors R and r which are required to produce these currents have to be calculated. Before this can be done we need to specify the transformer. A miniature 250 mA type is recommended, having a secondary voltage between 4.5 and 9 volts.

It is necessary to determine the output voltage of the transformer when it is delivering 120 mA. A.C. - guess work is not good enough when resistor values have to be calculated. Call this voltage 'V'

In the forward current direction the flow is reduced by the battery voltage and the drop across the diode, a total of 2.1 volts. Resistor r is by-passed so the voltage drop at 50mA is only across resistor R, hence $R = (V - 2.1) * 1000 / 50$.

The reverse current depends on the values of R and r (the diode can be ignored). The cell voltage assists the transformer voltage so $R + r = (V + 1.5) * 1000 / 10$.

Resistors are in standard sizes of 39,47,56,68,82 and 100 ohms and of course 390,470, etc. so there is no difficulty in finding suitable values close to the calculated ones.

DO NOT ATTEMPT TO CONSTRUCT ONE OF THESE UNITS UNLESS YOU HAVE SUFFICIENT ELECTRICAL KNOWLEDGE TO DO IT SAFELY - MAINS ELECTRICITY CAN KILL!

The transformer should be housed in a plastic or wooden box with small but plentiful holes for cooling. The cell carriers can be glued to the outside of the box (ARALDITE Rapid is excellent for this).

The mains plug must be fused - not more than a 3 amp type!

There is another method which has a certain appeal, not so accurate but avoids some of the difficulties.

Take a low-voltage mains adaptor with voltages of 4.5, 6, 7.5 and 9. Fairly standard, but it must be rated at a minimum of 250 mAmps. Open it up, take out the 4 diodes and any other components, then connect the output wires directly across the transformer secondary. Now you have A.C. coming out and you have your 4 diodes! Use 82 ohm and 680 ohm resistors for R and r respectively. (82's are not too common but you can put a 39 and a 47 in series instead).

These adaptors are rarely fused. You should fit a fuse carrier with a 1 amp glass fuse.

Put four cells in the carriers. Ease one cell out at one end and put an A.C. ammeter in series with the cell. Now adjust the voltage setting on the adaptor to give a reading nearest to 30 mAmps, the mean of the forward and reverse currents. (The total load will be approx 120 mAmps and the output voltage about 6 volts).

Another advantage of this method is that the box to hold the small components and support the cell carriers will not be at mains voltage, consequently it can be very simple, even a flat board, provided you take care not to get a short-circuit on the wires from the adaptor. If you could not fit a fuse in the adaptor you **must** have one in this secondary circuit.

Whichever method is adopted you eventually come to the question - **how do I know when to stop the charging process?** Not easy to answer. One protagonist of the method says "give them 12 hours - they can be charged overnight without pushing the charge-acceptance too far."

Another says "12 to 18 hours for zinc-carbon and zinc-chloride cells, 24 to 36 hours for alkaline types"! Isn't it always the same? Just when you think you are on to a good thing all sorts of doubts begin to creep in!

How about this? A new Duracell has an open-circuit voltage of 1.55 volts. I had a set of four which had been used for a short time. The OCV's were 1.50 volts. When each of the cells was shorted with a 33 ohm resistor, i.e. giving an output of approx. 45 mA the voltages only fell to 1.48 after a few seconds and fell no further in the next minute. I suggest that if a recharged cell will do this then anyone would be well satisfied.

I have carried out the following test procedure -

I bought a pack of eight Ever Ready 'Gold Seal' alkaline cells. They were not ones I would normally use but I reasoned that if the PCR charging method proved to be satisfactory with these then there would be no doubts about Duracells.

I ran both sets of four in the Z88, (without any timeout setting so it ran continuously) until I got LOW BATT. They lasted just a little over 3 hours.(Not too good - Duracells lasted 4.5 hours).

The first set I put in my NiCad charger (50 mA). Six hours later, when the cell voltages, on charge, were 1.65 they were taken out. Eight hours later the cell OCV's were all at 1.6 volts.

Doing the "Duracell test" each cell fell to only 1.56 volts after delivering 45mA for 1 minute.

The second set were put in the PCR charger for 12 hours - the voltage per cell whilst on charge had reached 1.56 which I considered was probably about as high as it was going to get. Two hours later the OCV was 1.55 per cell and the "Duracell test" only dropped the voltage to 1.52 - very satisfactory.

I decided to give them a more severe comparison with the Duracells - 180mA for 15 secs! The Duracell voltage dropped by .08, the Gold Seal by 0.1, not bad. (Note - all voltage measurements not specifying OCV were taken "on load").

My conclusions ? I like the PCR charger. I'm not unhappy about using the NiCad charger except that is very difficult to judge just when to discontinue the charge. I've had the cell voltages up to 1.75 at times and at other times it has soon become evident that they were not sufficiently charged. The PCR method is slower but, on my tests and considering that the main usage is the Z88, I'm not unhappy about this. In fact overnight charging is an advantage and I find it easier to remember when to start and stop the charge process.

Incidentally, always keep your batteries in the refrigerator. Capacity losses are reduced, very much so in the case of re-chargeables, if they are kept cold.

Happy charging!

(I can report that I have made one of these chargers, and yes, it does work extremely well- I am now conducting some experiments to confirm that the cells can actually be recharged about 20 times, for this would present a major saving for those of us using our Z88s a lot, without the hassles of having to use Ni-Cd batteries. At the moment I am looking at the possibility of producing a small quantity of them for sale through the Club. Price is not known yet, but would most probably be around the £20 mark (or 8 rechargings with Duracells at about £2.89 for four!), so let me know if you are interested. - Roy)

RANGER

COMPUTERS LTD

New Z88 Prices!

We are happy to announce new prices for the entire range of Z88 computers and peripherals.

Product	Price	Source
Z88 (UK)	£189.95	CCL
Z88 (USA)	£198.95	CCL
Z88 (Ranger Version)	£201.50	CCL
Z88 (International Versions)	£215.95	CCL
Rugged Ranger	£299.00	Ranger
Mains adapter	£8.95	CCL
Battery Pack	£37.50	Ranger
32k RAM Pack	£15.95	CCL
128k RAM Pack	£32.95	CCL
512k RAM Pack	£87.95	CCL
1M RAM Pack	£186.95	CCL
32k EPROM Pack	£17.95	CCL
128k EPROM Pack	£23.95	CCL
256k EPROM Pack	£57.95	CCL
PC Link	£27.95	CCL
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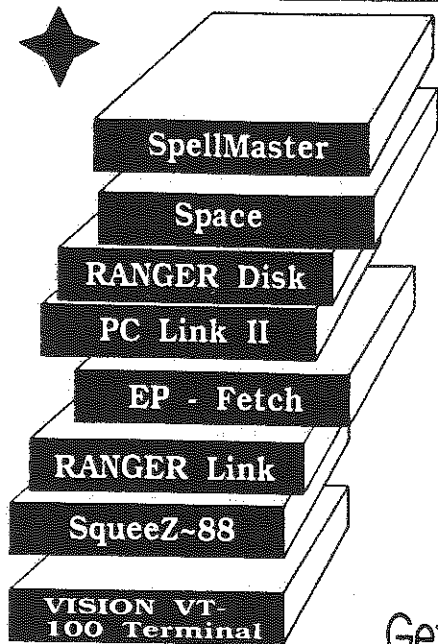
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The Numbers Don't Add Up...

by Vic Gerhardi - Rakewell Limited

It was a clear, bright Monday morning and I was looking forward to another week of unknown Z88 customer problems. I had barely had my breakfast when the first call of the day hit the 'Rakewell Help Line'.

The caller said:

'I've been saving files to that 256K eeprom you had sold me, and now whenever I want to save any more files, I get the 'Cannot Satisfy Request' message. Using Ranger's SPACE program, it shows that I have 70K left and I only want to save a 10K file!'

I assured him that I would try saving some files on my 256K eeprom and let him know the outcome.

This seemed to quite an easy thing to do, after all I had been saving over 100K worth of Club Software on the 256K Eeprom and had not had any problems at all. I then tried loading the files twice to the same eeprom and to my horror my Z88 did a 'soft reset.'

Perhaps I had a faulty Eeprom. Let's try another one. The same thing happened.

While the Eeproms were being erased and I was having a cup of coffee to steady the nerves I decided to give the supplier a call and find out if they knew of any funnies. 'No,' they said 'we made a PipeDream file and saved it several times onto the Eeprom until it was full - it worked fine.'

Meanwhile I was saving the files again on the newly erased eeproms, and watching my Z88 do a soft reset in the same place again.

I had a meeting arranged at Ranger later that week so I told them what I was experiencing. 'That is very strange,' was the response 'we have come across a minor problem with CLI but not that problem. We will run a few tests here and let you know'.

A day or two passed when I received a call from the suppliers. 'We think we have found something.'

What's this I thought, I'm not going mad after all this week. 'Everything is fine on the 256K eprom until you save a file greater than 64K. After that file has been saved, you can't save any more.'

'Well how come I get a soft reset then' I exclaimed. 'We have never had that,' they said, 'you must have a faulty Z88.'

Back in the Ranger camp they were running the same tests that I ran, and they did not get a soft reset either. They did confirm that if the file was greater than 64K you couldn't save any more files.

I rang the original caller again and asked him whether the last file he had saved was greater than 64K - it was - the mystery was over, life could now continue.

Here are the known bugs (so far) with the 256K Eproms.

1 If you save a file greater than 64K (65535 bytes on the Filer) that file will be saved, but no more files can be saved afterwards.

Possible solutions

If it is a PipeDream file you could split the file up into smaller files (naming them part 1, 2 and so on) and use the 'List File' option to join them all up again. This would have an added advantage in that the individual files would not take so long to load into PipeDream.

Squeeze the file (and make it smaller) before saving it to the Eprom using SqueezeZ'88.

2 If you use the ||+P option when Cataloguing Eprom it only prints the first 7 or 8 files in the list.

Solution

The ||+S CLI command works correctly.

To print the filenames out to a printer,

1 Use ||+S to Save the screen to a file first (use ||+S at the beginning to turn it on and again at the end to turn it off again).

2 Load RAM.-\S.sgn into PipeDream as a Plain Text file

3 Print the file from PipeDream using the <>PO

REMEMBER TO DELETE ALL THE FILES IN RAM.- WHEN POSSIBLE.

Acknowledgements to EFS and Ranger Computers Ltd.

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List Files in PipeDream

by William Sutherland (2145)

As an architect in sole private practice I am always looking for ways to increase productivity. I bought my Z88 about 2 years ago with a vague idea about word processing building specifications actually on the drawing board - I had been experimenting for about 7 years with home micros but found the word processing software disappointing and the machines cumbersome. The Z88 fits neatly on to my drawing board or desk and I can compose and edit text while working on a drawing - a great help in checking cross references etc.

I have been impressed by the flexibility of Pipedream for this sort of work, but it has taken a lot of effort by trial and error to achieve the impressive documents I can now produce and so I hope the following notes about my experiences with 'list' files may prove useful to others.

Page 128 of the manual 'explains' list files i.e. you save a master file with the 'save plain text' option and with the extension '.L'. When loading as a list file you omit the '.L' when typing in the file name and thereafter the special <>FN, <>FT etc. commands for 'next file', 'top file' etc. lead you through the files in the order that you typed them in your master file. Incidentally <>FB for 'bottom file' is tedious in the extreme, loading every file in sequence until it reaches the last!

My original problem started when I found that I was trying to edit normal single Pipedream document files well in excess of 90K. At this level Pipedream gets painfully slow. These large documents were building specifications which fall naturally into work sections (demolition, excavation, foundations, drains etc.etc.) The answer proved to be to separate these sections into individual files - in this case several dozen! - and create a 'list' file as previously described. This not only speeds up editing but keeps memory requirements low and so I can run several Pipedreams at once. This allows me to edit the master '.L' file as a plain text file in one Pipedream while editing the list file proper in another. The flexibility this allows is wonderful.

Basically I can keep dozens of standard specification sections in :ram.1 or :ram.2 and add or delete them from the plain text master file. By then rerunning the list file in another Pipedream I can check on the overall pagination.

Pagination is one of the most useful aspects of list files I have discovered so far. If you leave the 'Start Page' option blank in the <>O 'OPTIONS' menu in all your individual files that go to make up the master list file then the page numbers will start at 1 and remain in sequence no matter how you re-arrange the master list. The page number of any particular page within the list file document can be found on the <>O options display of the current file.

It suits me to start each section on a new page as this way I can have a different header and footer for each section - an extremely useful feature. However in order to ensure this happens it is important to insert a page break (<>EIP) as the very last line in each file. If you do not do this then Pipedream keeps counting lines as though the list file is one giant document and inserts soft page breaks at full page length intervals - ignoring file boundaries - amazingly clever this, although it caused a lot of headscratching when I first came across soft pagebreaks in unexpected positions. (Note that you will also need to check that there are no blank lines left after inserting the page break as the last line in the file.)

I tend to work backwards and forwards through the list file with the <>FN, <>FP commands and cross reference the sections. Any changes are automatically saved by Pipedream before allowing access to the next file in the list - a really neat safety feature.

Some useful things I have discovered while using Pipedream:-

- the cursor can be moved from column one to the extreme right of text on the previous line by SHIFT + left arrow.
- print control codes work in headers and footers so that for instance an underline code at the start of a 'left/centre/right' type header will give a line across the entire top of the page although there is no 'WYSIWYG' display of this either on the map or in the <>O options menu.
- I use Elite (12 chars. to the inch) a lot and so set the 'map' to 96 on the panel ([]) for A4 paper. The map correctly shows the margins and most importantly shows the header - and if the page

is long enough the footer (anybody know why the page length affects whether this is displayed or not?). I frequently use the '/left/centre/right' arrangement for headers and footers and the map shows if I have set it up correctly. The vertical line on the right of the map showing where the text window is in respect to the page also indicates the right hand edge of the paper. You have to be careful with setting the widths of columns so that they total no more than the page can hold, ordinarily 80 for pica, or 96 for elite. The headers and footers align themselves to the left side of the first column and right of the last column when 'left/centre/right' is used and ignore the left margin setting in the <>O Options menu.

- to help speed up editing keep the number of columns in use to a minimum and switch off the borders and automatic recalculation options from the <>O menu. I also turn off wordwrap when editing.

- if you want to print only one file within a list file don't try printing it when you are working within a list file as no matter which file on the list is currently on view Pipedream goes back to the first file in the list and starts printing from there. Better to open another Pipedream and load the individual file and print from there. You can always [P back to the list file to check the page number showing in the <>O options menu display and change this on the <>O options 'start page' of the individual file you have loaded although if you do this be careful of saving this file with a number inserted at 'start page' as the next time you run your list file and it reaches a file with a non blank entry at 'start page' it will restart subsequent page numbers from whatever this number is and you may only notice this after printing! Of course this could be useful if you wanted to leave room for diagram pages etc.

- I often 'block save' sections of text from one Pipedream and 'insert at slot' in another. I have seen mention of a bug in connection with this in letters to Z88 EPROM and when using the default number of columns I find the same 'offset' problem mentioned in 4.1.9. However I tend to use only 3 columns and when reloading via 'insert at slot' the only problem seems to be that another column is added to the whole document - i.e. I save a block from a file with columns A, B and C and <>FL it into a similar file via the 'insert at slot' option but find that a column D has been added to the file that is receiving the insertion. If you then save a block from the now four column file and reload it as before you find that the four column file has become a seven column file!... and so on. Being

aware of this it is simple enough to delete the unwanted columns - but it caused havoc with header and footer margin settings on print out until I noticed what was happening.

- I confirm a previously mentioned bug (3.5.12) that the screen is not cleared before the next file in a list file is displayed after a <>FN command. This can be alarming to look at not to mention confusing but seems harmless and can be scrolled off the screen by cursor down although personally I find using <>O and ESC quicker - incidentally if you try to use SHIFT + cursor down or <> + cursor down to clear the screen - it does'nt!

- when making up your list of filenames in the plain text master list file, give the full filename for the individual files as this allows you to keep files in whichever :ram. you like and does not confuse the master file if the default file setting on the Panel ([I]S) has been changed. Thus a master file might read when loaded as plain text in pipedream: :ram.1/spec1 :ram.2/spec2 :ram.0/spec3 etc.

Finally I would just mention that in the very heavy use I make of Pipedream the program has not 'fallen over' once although it can sometimes appear to - it can take 10 minutes or more to achieve a complex 'insert at slot' for example - patience is usually rewarded!

Zebedee's Magic Programming Lesson

by Michael W. Hey (0703)

Have you ever noticed how "off the cuff" remarks can have profound and long lasting consequences, unimagined at the time they are made. Back in 1984 I started working in a photographic laboratory in Derbyshire. My supervisor was a chap called Bryan, and on my first day I was being introduced to my new colleagues when one said, "Well, if he's Bryan you must be Zebedee." And I have been called Zebedee ever since.

Those of you old enough to remember "The Magic Roundabout" on T.V. will no doubt recall that Zebedee was the chap who used to appear at the end of a story and magically rescue the others from otherwise inextricable problems.

Zebedee was always my hero, so it is with honour that I have carried his name. I sign documents and forms with a single Z, and there is never any doubt as to who "Z" is. (There are three Michaels in the Department where I work, which can be terribly confusing.) So what has this to do with BASIC? (...I hear you ask).

Have you ever experienced a BASIC program which quits leaving the screen in a jumble of windows, and with text flashing on and off, or with no cursor visible (what was that code for getting it back?!!) There are some in the Club Software Library. I have actually written one myself (Gasps of Horror!) and I used to have to Kill BASIC and re-start it to get everything back to normal again.

KILLing BASIC and then re-incarnating always struck me as being a rather long-winded way of getting out of these messes, so why not invent a special "Zebedee" program to do everything as if by magic.

I alluded to such a possibility in one of my earlier rambles (See "A Rose by any other Name" in the June 1991 issue, page 5.5.22, I think that's the one which appeared in August.)

I hate people who say, "Such and such can be done very easily," but never trouble themselves to expound, and you can never work out how (very easily or otherwise). So here's how:-

```
10 *NAME (No program)
20 REM ''Zebedee.bas'' by Michael W. Hey (0703)
30 PAGE = 8960
40 VDU1, ASC''6'', ASC''#'', ASC''1'', 32, 32, 126, 40:
VDU1, ASC''2'', ASC''I'', ASC''1'': REM Window 1 fills
screen.
50 @%=&01020009
60 VDU1,127,1,67,1,83: CLS
70 PRINT ''BBC BASIC (Z80) Version 3.00'''''' (C) Copyright
R.T.Russell 1987''
80 NEW
```

When you type this into your Z88 please note that two of the lines are too long to fit one one line of the page. Line 40 is one and line 70 is the other. The whole long thing must be typed in as one line. Press ENTER at the end, not in the middle, or the program will not work. I try to keep the lines nice and short, but it is not always possible. (Do you follow that? Yes? Good.)

One note about line 30: before you type in this listing type PRINT PAGE [ENTER]. Your Z88 will print a number.

On my Z88 that is 8960. If your Z88 says something different then change that number. One or two programs (like the XOB Disc Manager software) change page when they run, but do not change it back when they Quit, which is why that line is there.

Line 40 does just what it says it does.

Line 50 restores the print format variable @%.

Line 60 gets rid of tiny, inverse, flashing, centered text, or whatever, by switching everything off (VDU1,127) and then remembers to switch the cursor and scrolling back on again.

As a final touch my program mimics the BASIC start-up screen....

Quite simple, isn't it?

On my Z88 this program takes up 292 bytes. Do not forget to SAVE it before you run it because it NEWS itself out of existence when it has done its good deed. (You can use OLD to get it back again, but why live dangerously?) You could save it as Z, to make it easier to use (CHAIN "Z"). As I said earlier, everyone knows who "Z" is!

This program can be incorporated into programs you might write yourself (e.g. a very useful MENU program) so that everything is re-set automatically

Here is something that really annoys me. In PipeDream, the Diary, PrinterEd and every other application I can think of file names are entered without quotes. In BASIC, however you must have them. LOAD ZEBEDEE.BAS just gives a "No such variable" error. Worse still, missing out the final " gives the doubly irritating Missing " error. If the Z88 is so clever that it can tell you that you have missed out the jolly " why doesn't it add them itself. They must come right at the end so why not put them there automatically and then load the program?

My second program does away with the beastly little objects entirely. It works in a similar fashion to "Zebedee.bas" (or "Z"), righting various wrongs, and then it draws a patterned "desk-top" and a neat dialog box (Oh, no! Not Macintosh again) in which you type your program name. If your Z88 cannot find the program this is reported. If a Bad program error occurs there is nothing it or I can do.

As before do not split long lines, and do not forget to SAVE the program before running ("FLORENCE"? "DOUGAL"? MR-RUSTY"?). You choose. I call it "N" for NEW PROGRAM. Now I am going, because it's time for bed.

Z88 EPROM - September 1991

```
100 ON ERROR PROCERROR
110 *NAME Next, please....
120 REM ===== INTRODUCTION
=====
130 REM Some BASIC programs are so antisocial. For example
some leave the Z88's screen
140 REM split into lots of little windows, or text
flashing on and off, or worse....
150 REM Some other programs do not use the *NAME command,
so that the name of the
160 REM previous program gets left in the Your Ref. column
of the Index. THIS program
170 REM sorts out all these problems. Not only that, it
also dispenses with the need
180 REM for '' marks, so you need never get that irritating
missing '' error which
190 REM really bugs me. Surely if the stupid computer
KNOWS what is missing, it could
200 REM insert the missing '' for you, instead of trying to
be a smart-ass.
210 REM This very user-friendly program was written for
your benefit by Michael W. Hey
220 REM of 18, Woodside Road, Sandiacre, Nottingham. NG10
5GP.
230 :
240 PROCRESET: PROCDEFINE: PROCDRAW: PROCINPUT: END
250 :
260 DEF PROCRESET
270 PAGE = 8960
280 VDU1, ASC''6'', ASC''#'', ASC''1'', 32, 32, 126, 40:
VDU1, ASC''2'', ASC''I'', ASC''1'': REM Window 1 fills
screen.
290 @%=&01020009
300 VDU1,127: VDU1,67,1,83
310 ENDPROC
320 :
330 DEF PROCINPUT
340 VDU1, ASC''6'', ASC''#'', ASC''2'', 43, 33, 104, 38:
VDU1, ASC''2'', ASC''I'', ASC''2''
350 PRINT message$, ''CHR$(1) ''B Which program do you
wish to run? ''': VDU1,66,1,67: INPUT '''' name$
```



```

360 program$ = name$
370 IF LEN(name$)>15 THEN name$ = '<A0>'
    '+RIGHT$(name$,14)
380 command$ = 'NAME'+name$
390 OSCLI command$
400 PROCRESET
410 CHAIN program$
420 ENDPROC
430 :
440 DEF PROCERROR
450 VDU1,127
460 dummy = INKEY(0)
470 IF ERR=252 THEN PROC_ERR252
480 IF ERR<>17 THEN PROCRESET: REPORT: PRINT ' at line
    ';ERL: END
490 *NAME (No program)
500 VDU1, ASC'6', ASC'#', ASC'1', 32, 32, 126, 40:
    VDU1, ASC'2', ASC'I', ASC'1': REM Window 1 fills
    screen.
510 CLOSE#0: CLS: VDU1,127
520 PRINT CHR$(1),'R';SPC(25);'BBC BASIC - (C)
    Copyright R.T.Russell 1987';SPC(24);
530 VDU1,127,1,67,1,83
540 NEW
550 ENDPROC
560 :
570 DEF PROC_ERR252
580 message$= CHR$(1)+'B 'FILE NOT FOUND' ERROR
    '+CHR$(1)+'B'+CHR$(10)+CHR$(13)+' Please check your
    typing, or specify the Directory, as I cannot find the
    file called '+program$+'.'
590 *NAME Next, please....
600 PROCDRAW: PROCINPUT
610 ENDPROC
620 :
630 DEF PROCDEFINE
640 VDU1,138,61, 65,12,30,30,63,33,51,51,63
    :A$=CHR$(1)+CHR$(130)+'?'+'A'
650 VDU1,138,61, 66,63,32,47,47,44,44,44,44:B$=CHR$(1)
    +CHR$(130)+'?'+'B'
660 VDU1,138,61, 67,63, 0,63,63,0,0,0,0 :C$=

```

```
CHR$(1)+CHR$(130)+"'?''+''C''
670 VDU1,138,61, 68,63,1,61,61,13,13,13,13 :D$
=CHR$(1)+CHR$(130)+"'?''+''D''
680 VDU1,138,61, 69,13,13,13,13,13,13,13,13:E$=
CHR$(1)+CHR$(130)+"'?''+''E''
690 VDU1,138,61, 70,13,13,13,13,13,61,61,1,63
:F$=CHR$(1)+CHR$(130)+"'?''+''F''
700 VDU1,138,61,71,0,0,0,0,63,63,0,63 :G$=CHR$(1)+CHR$
(130)+"'?''+''G''
710 VDU1,138,61, 72,44,44,44,44,44,47,47,32,63
:H$=CHR$(1)+CHR$(130)+"'?''+''H''
720 VDU1,138,61, 73,44,44,44,44,44,44,44,44,44:
I$=CHR$(1)+CHR$(130)+"'?''+''I''
730 A$ = STRING$(10,A$)
740 C$ = STRING$(36,C$)
750 G$ = STRING$(36,G$)
760 message$ = CHR$(13)
770 ENDPROC
780 :
790 DEF PROCDRAW
800 CLS: VDU1,50,45,83
810 FOR I% = 0 TO 7
820 PRINT A$;SPC(73);A$
830 NEXT I%
840 PRINT TAB(10,0);B$;
850 PRINT TAB(11,0);C$;C$;
860 PRINT TAB(83,0);D$;
870 FOR Y% = 1 TO 6
880 PRINT TAB(10,Y%);I$;SPC(72);E$;
890 NEXT Y%
900 PRINT TAB(10,7);H$;
910 PRINT TAB(11,7);G$;G$;
920 PRINT TAB(83,7);F$;
930 ENDPROC
```

Michael's program will also be available from the Software Library - details in the next Library Update.

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Nottingham
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HiTEK Marketing

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